

The Coupled Boundary Layers and Air-Sea Transfer (CBLAST) DRI Program Office

James B. Edson
Woods Hole Oceanographic Institution
MS #12, 98 Water Street
Woods Hole, MA 02543
phone: (508) 289-2935 fax: (508) 457-2194 email: jedson@whoi.edu

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LONG-TERM GOALS

The CBLAST DRI is an Office of Naval Research initiative focusing on processes that occur in the oceanic and atmospheric wave boundary layers, i.e., the regions influenced by ocean surface waves. The long-range goal of the proposed research is to understand air-sea interaction and coupled atmospheric and oceanic boundary layer dynamics at extremely low wind speeds where the dynamic processes are driven and/or strongly modulated by thermal forcing and extremely high winds speeds associated with hurricanes where there is no longer a distinct interface between the ocean and atmosphere. The low wind regime extends from the extreme situation where wind stress is negligible and thermal forcing dominates up to wind speeds where wave breaking and Langmuir circulations are also expected to play a role in the exchange processes. The hurricane regime will include investigations within and around hurricanes and tropical storms.

OBJECTIVES

The CBLAST program combines observational and modeling components in all of its investigations. These investigations will focus on processes that couple the turbulent atmospheric and oceanic boundary layers across the wavy interface through the exchange of momentum, mass, and heat. Therefore, understanding the influence of surface waves on determining the 3-D structure of these boundary layers is one of the main objectives of this program. Two regimes will be emphasized: a low wind, convectively (heating/ cooling) dominated regime, typically less than 5 m/s, that will include investigations of the transitions from stable to unstable flows where the buoyant forcing changes sign and from smooth to fully rough seas where wave-induced processes begin to dominate the exchange; and a very high wind regime with wind speeds greater than 20 m/s and up to hurricane strength where in situ and remote observations are desperately needed to improve and evaluate forecast models. The objective of the CBLAST program office is to help the CBLAST investigators with these efforts by organizing workshops, planning meeting, exchange of data and information via the internet. The program office will also lead the effort to publish an overview paper for the program.

APPROACH

The CBLAST program office will be located at the Woods Hole Oceanographic Institution (WHOI) and be headed by the principal investigator. The CBLAST program office will provide:

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1. *Organizational support for workshops and related activities as required by program management at ONR.* Several workshops are expected to be held during the lifetime of the program. The first workshop involved all components of the CBLAST DRI: Low winds, High Winds, Hurricanes, and Modeling. Other workshops are more likely to focus on the specific components. The program office will be responsible for setting up these workshops at appropriate times and locations. It is envisioned that some of these workshops will actually be run by the host institution with logistical support from the program office and ONR.
2. *Publication of an overview article for the CBLAST DRI.* A main objective of the program office is to develop an outline for overview article for the CBLAST DRI. This article is expected to contain all relevant components. It will be the responsibility of the program office to fill out this outline by coordinating contributions from the various components of the program.
3. *Logistical support for the field and modeling components of the CBLAST DRI.* The program office will assist in the coordination of the various field programs, and provide support when appropriate, between the field and modeling components of the DRI. Any decision-making activities will be jointly undertaken between the program office and the ONR program managers for the various components of the DRI.
4. *Organization of special sessions at national conferences for presentation of CBLAST results.* The program office will assist the principal investigators in setting up and holding special sessions to present significant results from the DRI.
5. *Management of the CBLAST DRI web site at WHOI.* This web site will be set up to contain an overview of the program components and objectives. It will ultimately display results from the various field and modeling components, and serve as a central link for the various data sources. This may involve links to individual web sites and perhaps a subset of the data for public consumption.
6. *Organization of a special issue or issues of CBLAST results in an appropriate journal.* The program office will assist the principal investigators in selecting and publishing results in a special issue of well-regarded journal. This would only be pursued if ONR and the scientist participating in the program decided that this was a worthwhile effort and did not unnecessarily impede publication of important results.
7. *General support of the program managers at ONR.* The program office will assist the program managers whenever possible with issues not included in the above list.

WORK COMPLETED

The program office continued to develop the CBLAST web site. The hurricane component of the web site was completely overhauled and the low wind component of the web site was updated to focus on the main experiment. The web site provides descriptions of the various components as well as an entry point for sharing data between the various investigators. The web site can be found at <http://www.whoi.edu/science/AOPE/dept/CBLASTmain.html>.

The program office helped to organize a CBLAST PI workshop held on the RSMAS campus at the University of Miami on 19-21 February, 2003. The workshop was held to discuss preliminary results and work on logistical plans for the CBLAST-Low and CBLAST-Hurricane main experiments that were successfully conducted in the summer of 2003. The program office is currently organizing a special session to be held at the 2004 Ocean Sciences meeting in Portland, OR.

The program office was heavily involved in coordinating the various components of the CBLAST-LOW experiment during this summer's IOP. Specifically, the program office assisted in the coordinated operations between the CIRPAS Pelican aircraft, the IR Cessna aircraft, and the Nobska

ship surveys. These activities are documented in an electronic log posted on the CBLAST-Low web site <http://www.whoi.edu/science/AOPE/dept/CBLAST/lowwind.html>.

RESULTS

No technical results to date.

IMPACT/APPLICATIONS

The web site facilitates data exchange and model results between the CBLAST participants. The organized meetings have provided a forum for the exchange of ideas to get the science moving forward.

RELATED PROJECTS

The program office is closely related to the CBLAST-Low efforts conducted by the WHOI PIs. These activities are summarized in their CBLAST-Low annual report.